



Pacific Island Network Quarterly



Science, cooperation,
and a few good maps
go up against an

OUTBREAK

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The National Park Service (NPS) has implemented natural resource inventory and monitoring (I&M) on a servicewide basis to ensure all park units possess the resource information needed for effective, science-based management, decision-making, and resource protection.

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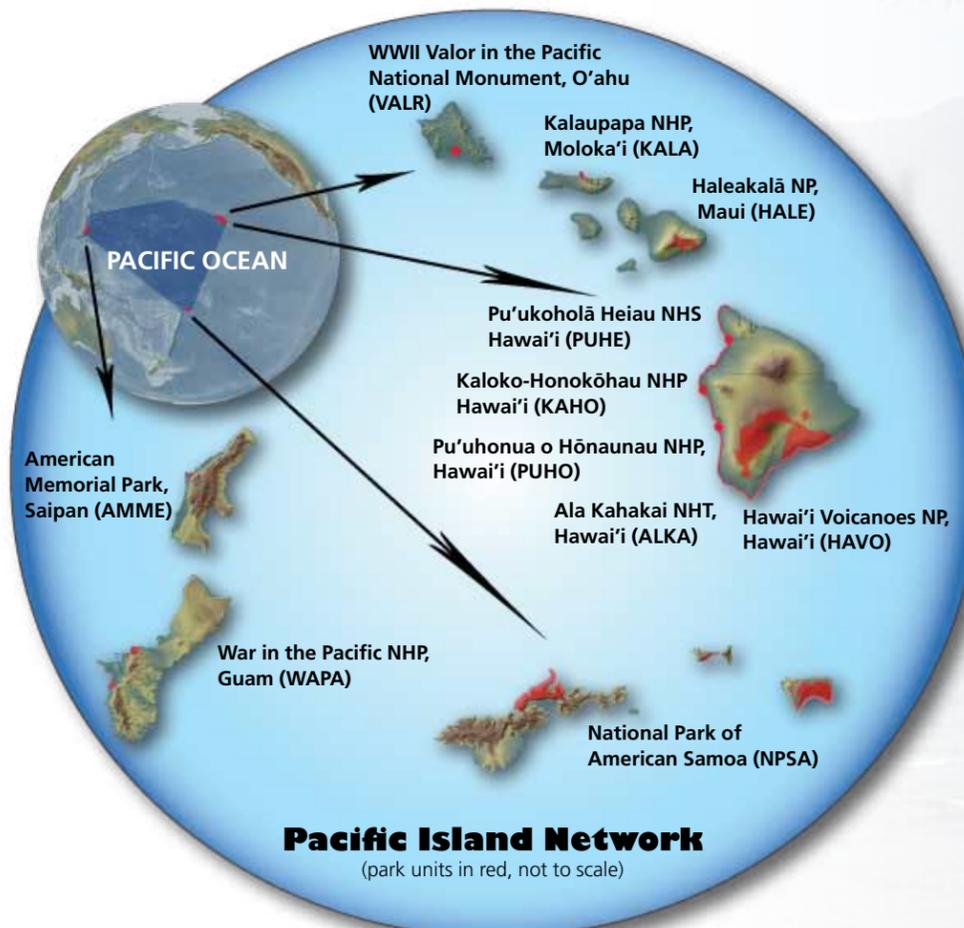
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NOTE: Unless indicated all photos and articles are NPS.

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Field Schedule

	Jan.	Feb.	Mar.
Anchialine monitoring			
Invasive plants		HAVO	HAVO
Vegetation communities			
Water quality	HALE	ALKA, PUHE, WAPA KALA, AMME	KAHO, PUHO NPSA, WAPA
Stream animals		WAPA	
Ground water		AMME	KAHO
Benthic marine			
Marine fish			
Vegetation mapping	HALE	HALE	HALE
Climate (on-going)	All Parks -----		



Pacific Island Network
 (park units in red, not to scale)

A few New Year's Thoughts from the Program Manager

Sometimes more than just "I" & "M"

Within the performance objectives of many Pacific Island Network team members, there is a statement that reads something like "...provides technical guidance and coordinates with parks as necessary." While inventory and monitoring is the daily hat we wear, we often field other technical requests from parks to help on a variety of projects. Every year, for instance, I read and edit park proposals for the *Servicewide Comprehensive Call*, and try to make sure that Pacific island park resource needs get the attention they deserve. It's a good process for me too because I learn about many of the pressing resource challenges park managers face.

While we get other regular requests, like data support on park condition assessments, there's a wide variety of help we provide whenever parks need our expertise. Our GIS Specialist, Scott Kichman, often fields park phone calls for troubleshooting GIS projects, and has developed a [mapping application](#) that park staff can use to create their own maps (also see page 5 for a related product). Earlier this year, for example, Scott was able to aid Hawai'i Volcanoes NP archeologists with processing LIDAR data and other technical support issues. In another instance for the National Park of American Samoa, Scott used monitoring data to quickly produce coral cover maps during a population explosion of the crown of thorns predatory starfish (see pages 6-7) so the park could prioritize treatment areas.

Recently, Marine Biologist Sheila McKenna, Aquatic Scientist Dave Raikow, and I provided technical comments on a draft environmental impact statement for a proposed residential and commercial development near Kaloko-Honokōhau NHP.

Our Science Communication Coordinator, Cory Nash, has served as the face of the park service in the Pacific islands for several years at the Hawaii Conservation Conference, and often is a primary science outreach representative at county fairs and park festivals. And, if you haven't checked out park science in the cybersphere, visit the popular [blog](#) we regularly contribute to in cooperation with most of the Pacific island parks.

One of the efforts that I am most proud of is the leadership role we've played in developing better safety procedures across the Pacific Island Network. In addition to our comprehensive readiness review process to ensure safe procedures before field work, our biotechs stationed in the parks created customized safety communication plans for War in the Pacific NHP / American Memorial Park, the NP of American Samoa, and Kalaupapa NHP that will help make the backcountry safer for everyone.

Our role as a Network serving a remarkable, albeit geographically remote, group of parks helps put us right in the middle of things. It's a great feeling when we can provide a valuable service to the parks!

Here's to the new year and the continued spirit of cooperation among us all.

Happy 2014,
 Greg Kudray



Chief Brown's Thoughts on the Partnership



integration of the I&M and Park programs.

Early on in the partnership it was clear that I&M and Park staff would have to work closely together due to the logistical challenges of working in the rugged HALE environment, where

many areas are only accessible by helicopter, and the weather is rarely cooperative.

As we enter the seventh year of the Inventory and Monitoring Program (I&M) conducting on-the-ground monitoring work at Haleakalā National Park (HALE), the collaborative partnership between the Program and the Park has never been stronger.

I&M began monitoring water quality and freshwater animals at [Haleakalā NP](#) several years ago. Since then, we've completed rounds of landbirds monitoring, and focal terrestrial plant communities and established invasive plants monitoring. Of course, we can't forget the inventories we've partnered on through the years with the intensive vegetation mapping inventory to be completed this year.

The data collected during the first rounds of monitoring establishes a strong baseline (the Park has already received the Technical Report from our initial [Landbirds Survey](#)) that will enable Park managers to look for resource changes and trends for decades to come. The Park is seeing an immediate benefit from the close

Whether it was having Park staff accompany I&M staff into the field, or reassigning Park staff to new I&M positions, the collection of data gave team members the opportunity to visit areas of the Park that hadn't been visited in 15+ years. These new field observations help managers make decisions regarding the allocation of limited resources, and help set priorities for our multi-year funding requests.

The work of the I&M and Park teams even contributed to HALE being awarded a \$750,000 National Fish and Wildlife Foundation grant to fence and restore newly acquired land on the leeward side of Haleakalā.

In addition to the positive impact on HALE's resources, the I&M team also has a positive impact on Park visitors. As a uniformed presence in the Park, I&M staff field hundreds of questions from visitors. I&M teams are able to educate

the public about the work they are doing, and about the natural and cultural resources of the Park.

I&M team members are also invaluable at helping the Park take care of our visitors. From the Aquatic Team assisting a visitor with a badly injured ankle, to the Vegetation Team providing crucial backcountry support during a multi-day Search-and-Rescue for a missing hiker, the I&M commitment to preparedness and safety continues to benefit all aspects of Park operations.

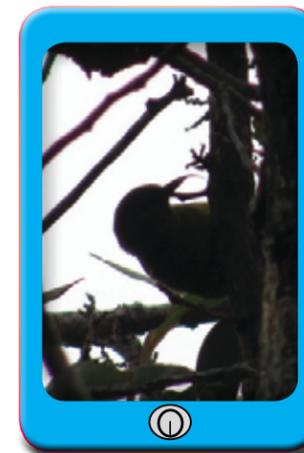
By working cohesively as one team (at times it is difficult to remember who is working for the Park and who is working for I&M) the Inventory and Monitoring Program is positively contributing to the current management of Haleakalā, and setting the groundwork for a long-term, productive partnership.

—Matt Brown, NPS HALE Resources Mgmt. Chief



'Aki is Spotted at the Top of Mauna Loa Road

On August 6, 2013, a celebrated member of the Hawaiian honeycreepers, the 'akiapōlā'au (*Hemignathus munroi*), was observed and photographed in the 3-trees area of Mauna Loa Road in Hawai'i Volcanoes NP. This is the first verifiable report of this endangered species in the area in over forty years. Stacia Near, a U.S. Geological Survey intern and student at Colorado State University, made the observation while conducting studies of the 'iwi (*Vestiaria coccinea*), also a Hawaiian honeycreeper.



While she was eating lunch, Stacia became aware of soft tapping in the koa (*Acacia koa*) tree above her. She looked with her binoculars to see an 'akiapōlā'au foraging for insect prey in the branches of the young koa. Stacia was able to photograph the bird, which was apparently preoccupied with eating its lunch, with her cell phone camera. Many of the images were indistinct, but several showed the bird in classic foraging poses seldom used by other species and one clearly showed the

long hooked upper mandible and straight, chisel-like lower mandible. The few photos that showed plumage color suggested that the bird was probably an adult female.

The bird did not call or sing during the 20 minutes or so that Stacia observed it.

Having spent much time in

the area observing 'iwi during the past several years, we are confident that the 'akiapōlā'au is not a local resident. The nearest population from which she may have dispersed is Keauhou Forest, only a few miles to the east. Although Stacia searched for the bird in the following days and weeks, there was no further sign of the species.

'Akiapōlā'au were often seen in this and other koa kipuka along Mauna Loa Road during the 1940s, but the range of the species has contracted and numbers have decreased markedly since then. Following the removal of feral goats and pigs in the 1970s and 1980s, habitat conditions have been improving in the region. We might wonder if this lone 'akiapōlā'au was prospecting for a mate while she sampled the habitat during her travels.

As habitat conditions continue to improve, we also might expect 'akiapōlā'au sightings to become more frequent. Eventually, 'akiapōlā'au may become re-established as a resident in this section of Mauna Loa, where the mix of koa, 'ōhi'a (*Metrosideros polymorpha*), and māmane (*Sophora chrysophylla*) provide foraging opportunities not found in the wetter portions of the species' range.

—Rhonda Loh, NPS HAVO Chief of Natural Resources

[Click for more photos of this bird](#)

I&M will conduct forest bird monitoring near Mauna Loa Road in 2015. We'll keep an eye out for the 'aki.

Google Earth Tour of the PACN

Have you ever wanted to travel to all the national parks in the Pacific islands? I am talking about Hawaii, Saipan, American Samoa, and Guam! It would be very expensive and time consuming.

Take, for example, the National Park of American Samoa. This park is spread out over 3 different islands: Tutuila, Ofu-Olosega, and Ta'u. Wouldn't it be interesting to "fly" to these islands using Google Earth and learn exactly where Ta'u is?

With this app (for computer or phone), you can get a great aerial view of the parks, and develop a sense of the vast distances among these amazing places, as well as the mainland United States.

The Google app gives you information about the parks through NPS park and Inventory & Monitoring web sites. The app also provides a touring section which locates points of interest in the vicinity of the park you are visiting.



The app is so easy to use. Just contact me at: scott_kichman@nps.gov and I will email you a small KML file to drop into Google Earth to get you started. Happy travels.

—Scott Kichman, NPS GIS Specialist



Corallivore

Crown of Thorns Starfish Wreak Havoc in American Samoa — The NPS Responds

Found throughout the Indo-Pacific, the crown of thorns starfish, *Acanthaster planci*, is one of the largest sea stars in the world (up to 45 cm across). Unlike the typical starfish with five arms, the crown of thorns starfish is disc-shaped with multiple arms (up to 21) covered in poisonous spines. These unique features gave rise to this starfish's commonly referred to name of the crown of thorns.

Acanthaster planci is a corallivore, which means that it feeds on live coral tissue. After climbing on a coral colony, the crown of thorns starfish extrudes its stomach out through its mouth and spreads it over the surface of the corals. The stomach secretes digestive enzymes that liquefy the coral tissue which is then absorbed. After this process, the coral colony is left devoid of living tissue and only the white skeletons of the colony remain. On the skeletons, the starfish leave behind observable feeding scars which mark the paths of their destruction. Without the living tissue, the skeletons become more vulnerable and brittle, and are often colonized by non-reef building organism such as algae.

Known as voracious predators, a single crown of thorns starfish can consume approximately 6-10 square meters of living reef per year. Low densities of *Acanthaster planci* naturally occur on reefs with little impact to the ecosystem. However, under certain conditions periodic population explosions of these



Crown of thorns starfish outbreak on the coral reefs of the National Park of American Samoa.

starfish can occur on reefs, generating alarm due to the extensive damage they can unleash to the corals and the reef ecosystem.

Acanthaster planci has been documented as moving up to 35 cm/minute, thus in short period of time a large amount of damage can be done. Envision a dinner plate size worth of damage to the reef by each starfish each day.

A study in the Central Great Barrier Reef region documented large crown of thorns starfish (40 cm and greater) decimating live coral at a rate of 161 cm²/day in winter and 357-478 cm²/day in summer.

In addition to being a fast eater, the crown of thorns starfish can also be a picky one, having innate preferences for certain coral species over others. Corals species from the genera *Acropora* and *Pocillopora* are their preferred foods. Controlled laboratory studies have shown preferences even within the genus *Acropora* with the most preferred species being *Acropora hyacinthus*, followed by *A. gemmifera*, *A. nasuta*, and *A. formosa*. However, when food becomes limited, the crown of thorns starfish is known to eat all species of hard coral, and then start eating the soft corals.

Unfortunately, the National Park of American

Samoa (NPSA) is experiencing an ongoing outbreak of this hungry corallivore. Luckily, the park and the Pacific Island Network Inventory & Monitoring Program (I&M) have been monitoring the benthic marine community in NPSA as a “Vital Sign” since 2007. Site specific reef data on the coral species are included as a part of the [benthic marine community monitoring protocol](#). By knowing which reefs have the crown of thorn's preferred food species (e.g., species from the genera *Acropora* and *Pocillopora*), park managers can better identify reef sites for culling and removal of this starfish. Geo-referenced maps of monitored reefs showing coral cover and species were rapidly provided by I&M to NPSA to help the park prioritize their efforts (see photo caption below).

Combining this data with proven field techniques, National Park of American Samoa

Marine Ecologist, Dr. Tim Clark, has estimated that 6,433 crown of thorns starfish have already been removed from several sites across Tutuila Island. But there is much work left to do.

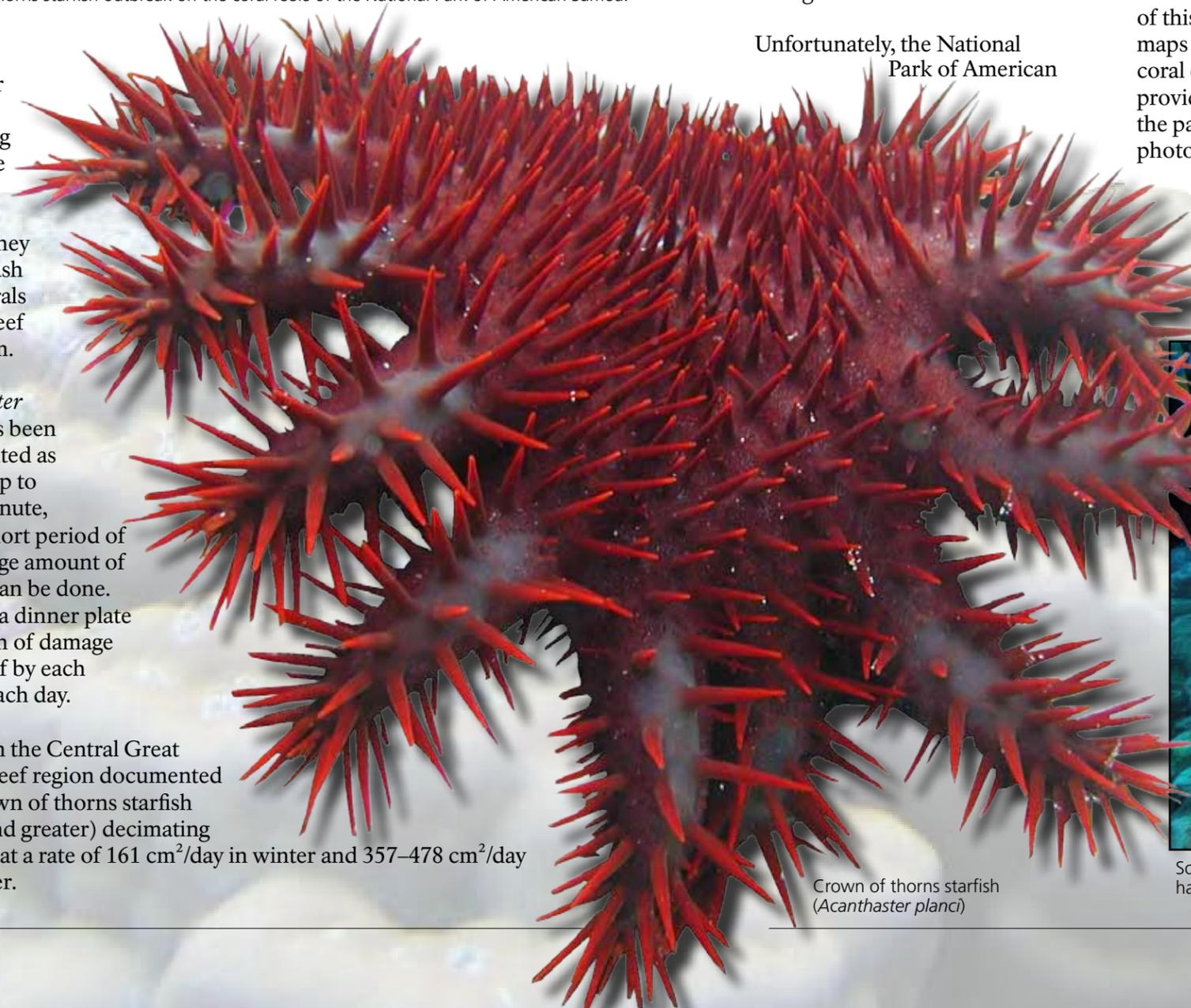
This is an excellent example of employing long-term monitoring data to inform efficient management action for one of our most precious natural resources.

—Sheila A. McKenna, NPS Marine Biologist

For more on the outbreak in the National Park of American Samoa, visit this [posting](#) on the [Pacific Island Parks blog](#).



Short video on coral reef monitoring in Pacific Island national parks. <-- CLICK



Crown of thorns starfish (*Acanthaster planci*)



Sodium bisulfate is injected into the destructive starfish to cull them. The chemical is harmless to the surrounding reef ecosystem, but deadly to the corallivore.

Climate Change Isn't Going Away

So let's keep talking about it with two new products for 2014

POSTER

A choice for Hawaii's future

Climate changes are happening now. The mountains are warming, allowing disease-carrying mosquitoes to reach native birds. It doesn't rain as often as it used to, but storms are more intense than ever. Sea levels creep up a little every year, and below the surface, coral reefs are sickened by warmer and more acidic waters. The oil, coal, and gas we burn are the culprits. It's our problem to fix. We still have time to choose our Hawaii if we act now.

YOU HAVE A CHOICE — Reduce your fossil fuel consumption

2014 Calendar

The Earth is getting warmer and higher temperatures mean big changes for the entire planet, including those of us who live on Pacific islands. The surface of the Earth has warmed about 1°F since the mid-1970s and the eight warmest years on record have all occurred since 2001. By the end of this century, the best estimate of temperature increase is 5.4°F. Oceans are also becoming warmer and more acidic due to the absorption of carbon dioxide (CO₂) into the water, creating carbonic acid.

These effects, and others related to human induced changes like sea level rise, are known as climate change. Greenhouse gasses, such as CO₂ and methane, allow heat from the sun to be absorbed by the land and the ocean. This natural effect keeps the earth at a stable temperature, however the vast amounts of greenhouse gasses that humans have released through our burning of fossil fuels (coal, oil, etc.) has vastly increased CO₂ concentrations since the Industrial Revolution. The last time CO₂ levels were this high was at least 15 million years ago before humans even existed. Back then, global temperatures were 5-10°F higher with sea levels 75 to 120 feet higher, and very little permanent ice on Earth.

This is extreme, but it may be the direction that the Earth is heading. If we can't curb our thirst for CO₂ producing fossil fuels, conditions on Earth will be dramatically different for humans in the future. Even today, we can already see changes happening to the land, sea, and everything (and everyone) that lives on the planet.

CONTACT corbett_nash@nps.gov for a free calendar or poster while supplies last.

